memorandum

Environment and Resources Division

Date September 20, 2012

To Tom Born, Wendy Hoffman, U.S. Environmental Protection Agency

From David Mitchell and James Palardy

Subject Review of NPDES Permits for Conditions Related to Impingement and Entrainment losses of Threatened and Endangered Species (WA5-05-Task 6).

1. Introduction

To support USEPA in the development of potential rulemaking for CWA Section 316(b), Abt Associates conducted a brief review of National Pollution Discharge Elimination System (NPDES) permits at selected 316b facilities to identify and summarize any requirements for reducing or preventing impingement and entrainment (I&E) of threatened and endangered (T&E) species. We selected eight active power generating facilities (Table 1) with the highest number of overlaps with T&E species (according to an overlap analysis) with emphasis on selected facilities in Inland or Coastal regions (including Great Lakes). We reviewed these permits (and accompanying Fact Sheets where available) to identify whether studies of T&E species have been conducted in the vicinity of the facility or if there were any identified T&E monitoring, operational management, or technology requirements in the Permit to reduce or prevent I&E losses of T&E species.

Review of the eight permits indicated:

- None of the eight discharge permits reviewed had special conditions or requirement specifically aimed at protection or minimization of I&E losses to endangered species. For one of the plants, this issue has been raised by NMFS over a pending draft permit (Columbia Generating Station).
- Two permits indicated that the state agency had considered T&E species and had concluded that the facility did not pose an adverse risk, but no details were given.
- Two permits required improvements to reduce I&E losses through technology and management improvement, but these were due to concern for the resident aquatic community and not any identified T&E species.
- One permit Fact Sheet indicated the facility had conducted an Essential Fish Habitat (EFH) survey and Endangered Species Act (ESA) review as the basis for no adverse impact.
- Most concerns regarding facility impacts to aquatic receptors were focused on the facility discharges (particularly thermal pollution) and not the I&E associated with cooling water intake structures (CWIS).

Further detail and analyses for the individual power plants is given below.

2. Facilities

Facilities were selected on the basis of the facility's cooling water intake structure (CWIS) location and overlap with designated critical habitat of T&E species. From this analysis, we prioritized facilities on the basis of the number of overlaps with critical habitat. Eight facilities were selected from six states (FL, GA, ME, OR, VA, WA) and included five inland facilities discharging to freshwaters and three coastal facilities discharging to estuarine waters. Several other facilities were initially identified with multiple habitat overlaps (Antioch, CA, CAMEO, CO, Mason Steam, ME), but were eliminated because these plants have been permanently closed.

Table 1. List of Facilities Selected for NPDES Permit Review

Facility Name	NPDES Permit #	Category	Receiving Water	State	Critical Habitats	Salmonid Habitat
PGE Beaver Generating Facility	OR002743-0	Inland	FW	OR	4	3
APC Clinch River Plant	VA0001015	Inland	FW	VA	4	0
NE Columbia Generating Station	WA002515-1	Inland	FW	WA	2	2
GPC Mitchell Plant	GA0001465	Inland	FW	GA	7	0
Port Townsend Paper Company	WA000092-2	California	Estuary	WA	3	2
GPC Scholz Generating Plant	FL0002984	Inland	FW	FL	8	0
Vero Beach Municipal Power Plant	FL0002983	S. Atlantic	Estuary	FL	1	0
Verso Bucksport LLC	ME0002160	N. Atlantic	Estuary	ME	1	0

3. Permit Review

For each of the facilities, we obtained the most current NPDES permit (some were expired but were still in force (stayed)) and, if possible, the accompanying fact sheet. We reviewed these documents to assess whether studies of T&E species have been conducted in the vicinity of the facility or if there were any specific T&E monitoring, operational management, or technology requirements to reduce or prevent I&E losses of T&E species.

Portland General Electric Beaver Generating Facility

Background: The Portland General Electric (PGE) Beaver Generating Facility is located north of the City of Clatskanie on the south bank of the Columbia River. The Facility is a combined cycle electric generating plant that consists of six gas turbine generators, heat recovery, and a steam turbine generator. The plant is rated at 520 megawatts (MW). The plant discharge is a mixture of cooling water, demineralizer back-wash, neutralization tank effluent, and oil-water separator effluent (ODEQ 2007a).

The plant discharges to the Columbia River through Outfall 001 located at River Mile 53. The outfall discharges approximately 32 feet below the surface of the Columbia River at a point 450 feet from shore.

The PGE permit sets limits on total suspended solids (TSS), Oil & grease, pH, maximum flow, and excess thermal load. The PGE permit sets limits on total suspended solids (TSS), Oil & grease, pH, maximum flow, and excess thermal load. The current NPDES permit will expire in November 2012.

T&E Issues: The PGE Beaver Generating Facility is located on critical habitat for four T&E species, including three protected salmonid species (Chum Salmon, Steelhead Trout, Chinook Salmon) and Bull Trout. Permit concerns with T&E species appear to be concerned with thermal pollution of the discharge and its proximity to salmonid habitat rather than with I&E mortality. In response to temperature issues at this facility, PGE submitted a Temperature Management Plan. A mixing zone study was completed for this facility in 1999, and was subsequently reviewed and approved by the ODEQ (ODEQ 2007a). Temperature mixing zones and effluent limits were established to prevent or minimize adverse effects to salmonids inside the mixing zone.

Under the Permit Special Conditions, it was noted that the permittee's effluent Temperature Management Plan and Alternatives Analysis (TMP/AA) document for the Beaver Plant was approved by the Department on October 14, 2003. The facility must continue its current program for temperature management/reduction, as outlined in the TMP/AA

Appalachian Power Company Clinch River Plant

Background: The Appalachian Power Company Clinch River Plant is located in Carbo, VA with permitted discharges to the Clinch River. The Plant functions as a coal-fired electric power station, operating since 1958, and consists of three 235 megawatt generator units. Combined wastewater streams from ash tank overflow, boiler room sumps, cooling tower blowdown, seal and cooling water, and various plant drains are discharged into the Clinch Rive, in addition to coal pile runoff and ash pond outflow. The current Clinch River Virginia Pollution Discharge Elimination System (VPDES) permit will expire in September 2015 (VDEQ 2010).

T&E Issues: The Clinch River Plant is located on critical habitat for four species of T&E freshwater mussels (Cumberlandian Combshell, Oyster Mussel, Rough Rabbitsfoot, and the Purple Bean), but no discussion was found protection or measures to be taken regarding losses that are attributable to I&E of the Clinch River Plant. There is substantial evidence that toxic spills in 1967 and 1979, effluent copper concentrations from outfalls, and pollutants from ash pond runoff have historically impaired Clinch River biota, particularly freshwater mussels (Hull 2002). However, no special conditions or provisions for protection or monitoring of the T&E species are included in the permit (VDEQ 2010).

Energy Northwest Columbia Generating Station

Background: The Energy Northwest Columbia Generating Station is located on the U.S. Department of Energy (USDOE) Hanford Site, about 12 miles north of Richland, WA. Columbia Generating Station is a 1,150-megawatt boiling water reactor that uses nuclear fission to produce heat and is the only commercially operated nuclear power plant in the Northwest. The facility uses a closed-cycle, non-contact cooling system.

Three separate internal waste streams enter the discharge conveyance to surface water. The major waste stream (in terms of volume), is the "blowdown" from the circulating cooling water system.

The facility discharges to the Columbia River, a Class A receiving water, at River Mile 353 where a buried 18-inch pipe emerges approximately 175 feet from the shoreline at low flow (EFSEC 2006a). The current Columbia Generating Station NPDES permit expired in May 2011, but was extended to allow for a supplemental discharge characterization.

The Columbia River is water quality impaired for temperature and USEPA and the Washington Department of Ecology are conducting a joint TMDL study to correct the impairment (EFSEC 2006a). In 1985, the facility conducted a thermal plume study in the receiving water to demonstrate that the discharge would comply with water quality standards under a variety of river flow conditions. The current permit (issued in 2006) required that an Effluent Mixing Study be conducted to determine the degree of effluent and receiving water mixing in the mixing zone (EFSEC 2006b)

T&E Issues: The Columbia Generating Station is located on critical habitat for two T&E salmonid habitats (Steelhead Trout and Chinook Salmon). However, the current extended permit does not contain special conditions or provisions for protection or monitoring of the T&E species relative to I&E losses (EFSEC 2006b). In May 2012, National Marine Fishery Service (NMFS) notified the Energy Facility Site Evaluation Council (EFSEC) of the presence of several Federally protected species of steelhead salmon and critical habitat in the vicinity of water intakes and discharges of the plant and requested an opportunity to evaluate the draft permit (NFMS 2012). NMFS stated that the next NPDES permit must "require that the location, design, construction, and capacity for cooling water intake structures reflect the best technology available for minimizing adverse environmental impact".

For this particular facility, permit provisions must provide for adequate protection of ESA-listed salmonid species (Upper Columbia River (UCR) Spring Chinook and UCR Spring Steelhead). Specifically, UCR steelhead adult fish spawn and juveniles rear, near the plant's intake and discharge structures and these structures should be designed to minimize I&E of fry and juvenile salmonids. NMFS suggested use of the Anadromous Salmonid Passage Facility Design manual (NMFS 2011) for guidance on design of water intake systems to minimize impacts to anadromous fish.

Georgia Power Company W.E. Mitchell Plant

Background: The Georgia Power Company W. E. Mitchell Steam-Electric Generating Plant is located in Albany GA. It is a coal-fired and combustion turbine facility with four units and capable of producing 243,000-kilowatts. Discharge waters include once-through cooling water, boiler blowdown, sump water, ash transport water blowdown, and various stormwater flows. The receiving water is the Flint River. The current Flint River NPDES permit will expire in March 2015 (GDNR 2010).

T&E Issues: The upper Flint River Basin historically supported at least 25 species of mussels including 6 federally listed species and five fish species that are endemic to the Apalachicola River Basin occur in the upper Flint River Basin (USGS, 2006). The Mitchell Plant is located on critical habitat for four federally-listed freshwater mussel species: Shinyrayed Pocketbook, Oval Pigtoe, Gulf Moccasinshell, and Purple Blankclimber.

The permit indicates that a thermal mixing zone has been established for the discharge, but no discussion was found regarding prevention of losses that are attributable to I&E losses. No special conditions or provisions for protection or monitoring of the T&E species are included in the permit (GDNR 2010).

Port Townsend Paper Corporation

Background: The Port Townsend Paper Corporation facility is an unbleached pulp and paper mill located in Port Townsend, WA. Discharge waters include secondarily treated sanitary wastewater and process wastewater (WDOE 2004a). The process wastewater flow averaged 12.5 MGD during 2002-2003 and major pollutants of concern were biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH (WDOE 2004a). In addition, the facility discharges about 3 MGD of turbine condenser cooling water into the Port Townsend Bay with temperature as the only pollutant of concern. The discharge outfall extends about 1200 feet from shore into Port Townsend Bay into about 40 feet of water. The Port Townsend NPDES permit expired in August 2009 and it is assumed that the permit has been stayed (extended) (WDOE 2004b).

Port Townsend Bay is a class A receiving water with characteristic uses include the following: industrial water supply; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation (WDOE 2004a). In discussing the effluent mixing zones of the discharge, WDOE reported that there are no concerns with the mixing zone encroaching onto sensitive habitat or overlapping with other mixing zones (other permitting discharge go to Port Townsend Bay). Further, WDOE indicated that the acute mixing zone was not located where it could create a barrier to the migration or translocation of indigenous organisms (WDOE 2004a).

T&E Issues: The Port Townsend Paper Corporation facility is located on critical habitat for three T&E species including habitats for two salmonid species (Chum Salmon and Chinook Salmon) and for Killer Whales (which are unlikely to be affected by I&E). However, no special conditions or provisions for protection or monitoring of the T&E species are included in the permit (WDOE 2004b).

Gulf Power Company Scholz Electric Generating Plant

Background: The Gulf Power Company Scholz Electric Generating Plant is located in Sneads, FL. This facility consists of two coal fired steam electric generating units (Units 1 and 2) with a total rating of 80 megawatts (MW) and a gross generation capacity of 98 MW. The discharge consists of once-through non-contact cooling water and ash pond overflow (FDEP 2010a). The facility discharges 129.6 MGD into an on-site discharge canal and eventually to the Apalachicola River (Class III fresh waters), which is currently considered impaired for mercury. The current GPC Scholz NPDES permit will expire in September 2015 (FDEP 2010b).

T&E Issues: The GPC Scholz Electric Generating Plant is located on critical habitat for eight federally-listed species, including seven freshwater mussel species (Fat Threeridge, Chipola Slabshell, Purple Bankclimber, Shinyrayed Pocketbook, Gulf Moccasinshell, Ochlockonee Moccasinshell, and Oval Pigtoe) and Gulf Sturgeon. However, the associated Fact Sheet indicated that the FDEP did not anticipate adverse impacts on threatened or endangered species as a result of permit issuance (FDEP 2010a).

GPC submitted an "Impingement and Entrainment Mortality Characterization Study" in support of compliance with Section 316(b) Phase II Rules prior to their suspension in 2007. The study provided reasonable assurance that the facility does not have a significant adverse effect on resident fish populations within the Apalachicola River system. Since that time, FDEP indicated that it has continued its longstanding practice to apply Section 316(b) on a case-by-case basis to existing facilities using best professional judgment (BPJ) (FDEP 2010a). In order to continue to protect the resident fish community, conditions were added to the permit to limit the maximum through-screen velocity to the current operating practices at the facility and to develop a plan to explore the feasibility of constructing a fish return system for the facility.

No special conditions or provisions for protection or monitoring of the T&E species are included in the permit (FDEP 2010b).

Vero Beach Municipal Power Plant

Background: Vero Beach Municipal Power Plant (MPP) is an electric generating plant located in Vero Beach, FL. It has four steam electric generating units capable of producing 158 megawatts. The facility uses a total of 217 MGD from the Indian River as once-through non-contact cooling water and discharges it back to Indian River (Class III marine water) along with other minor effluent flows. The current Vero Beach MPP NPDES permit will expire in March 2015 (FDEP 2008b).

T&E Issues: The Vero Beach MPP is located on critical habitat for one T&E species, the Florida manatee. The Florida Department of Environmental Protection (FDEP did not anticipate adverse impacts on this species provided that Vero MPP continue to comply with the FDEP-approved Manatee Protection Plan established in 2000. This plan is subject to review and comment from the Florida Fish and Wildlife Conservation Commission and the U.S. Fish and Wildlife Service (2008b)

The Fact Sheet provides a discussion of CWA Section 316(b) rule requirements and documented the 2007 suspension of the Phase II requirements (FDEP 2008a). Since that time, FDEP indicated that it has continued its longstanding practice to apply Section 316(b) on a case-by-case basis to existing facilities using best professional judgment (BPJ). A number of new permit condition arising from this including: (1) restriction of through screen velocities at the intake structures, with a range of 0.42 – 0.68 fps for the three intake structures; (2) thrice daily operation of traveling screens; and (3) all live fish, shellfish, and other aquatic organisms collected or trapped on the intake screens are required to be returned to their natural habitat.

Based on the size of the federally-protected species (manatee), no special permit conditions or provisions for additional protection against I&E losses are warranted.

Verso Bucksport

Background: Verso Bucksport LLC facility is a pulp and paper mill located in Bucksport, ME. The current NPDES permit allows discharges of a monthly average of 18.0 million gallons per day (MGD) of secondary treated pulp and paper production process wastewater, treated landfill leachate and filter backwash water, and up to a monthly average flow of 72.0 MGD of non-

contact cooling water and an unspecified quantity of stormwater runoff from a paper manufacturing facility to the Penobscot River. The current Verso Bucksport NPDES permit will expire in September 2014 (MDEP2010).

T&E Issues: The Penobscot basin is the largest in Maine and historically supported culturally and economically significant populations of migratory fish. The Verso Bucksport facility is located within critical habitat for one T&E species, Atlantic Salmon.

The facility has conducted studies to determine is the facility discharges have some impact. As noted by MDEP, Verso Bucksport submitted a report from a consultant hired to perform an Essential Fish Habitat (EFH) and an Endangered Species Act (ESA) Review (June 2001) for the previous permitting action. The review concluded that the discharges of process wastewater and/or cooling water do not negatively impact essential fish habitat for Atlantic salmon, pollock, whiting, red hake, white hake, winter flounder, windowpane flounder, American plaice or Atlantic herring. The review also concluded the facility discharges will not negatively impact endangered or threatened species, particularly shortnose sturgeon and Atlantic salmon.

Review of the permit indicated no discussion regarding prevention of losses that are attributable to I&E losses. No special conditions or provisions for protection or monitoring of the T&E species are included in the permit (MDEP 2010).

4. References

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